

2016
5th Grade Problem Solving, Round 1

1.	Five friends are standing in a line. Cliff is standing directly behind Danny, and there are two people between Cliff and Mark. Mark is standing somewhere behind Eric but somewhere in front of Tom. Which of the five friends is fourth in line?	
2.	Terry needs at least four square feet of floor space per bird in his chicken coop. Terry plans to build a 30-foot by 20-foot chicken coop. What is the maximum number of chickens he can house?	
3.	The ratio of boys to girls in a class of 35 students is 3:4. How many more girls than boys are in the class?	
4.	What is the 99th letter in the pattern below? ABBCCDDDD	

Team Number _____

Score _____ / 40

5th Grade Problem Solving, Round 1 Answers

1.	Five friends are standing in a line. Cliff is standing directly behind Danny, and there are two people between Cliff and Mark. Mark is standing somewhere behind Eric, but somewhere in front of Tom. Which of the five friends is fourth in line?	<u>Danny</u>
2.	Terry needs at least four square feet of floor space per bird in his chicken coop. Terry plans to build a 30-foot by 20-foot chicken coop. What is the maximum number of chickens he can house?	<u>150 chickens</u>
3.	The ratio of boys to girls in a class of 35 students is 3:4. How many more girls than boys are in the class?	<u>5 more girls</u>
4.	What is the 99th letter in the pattern below? ABBCCDDDD	<u>N</u>

Team Number _____

Score _____ / 40

5th Grade Problem Solving, Round 2

i 1.	A rectangular prism has a volume of 384 cubic centimeters. The width 8 cm, which is double the height, and the length is three times the height. What is the length of the prism?	
2.	While on vacation, Craig bought a pair of sunglasses for \$15.98, a hat for \$7.99, 5 postcards, and a beach towel. The beach towel costs \$0.50 more than half the price of the sunglasses. Craig gave the cashier \$40 and got \$3.59 in change. Each postcard cost the same. How much did each postcard cost?	
3.	Three years ago Mary was three times as old as her sister. Now Mary is twice as old as her sister. How old is Mary now?	
4.	An apple pie and a pumpkin pie are being served at Thanksgiving dinner. The apple pie is sliced first. One person eats $\frac{1}{12}$ of the pie, a second person eats $\frac{1}{24}$ pie, and a third person eats $\frac{1}{12}$ pie. The pattern continues in this way. When the pumpkin pie is sliced for the first time, the first person eats $\frac{1}{9}$ of the pie, a second person eats $\frac{1}{18}$ pie, and a third person eats $\frac{1}{9}$ pie. The pattern continues in this way. If both pies have been eaten, how many more people have eaten apple pie than pumpkin pie?	

Team Number _____

Score _____ / 40

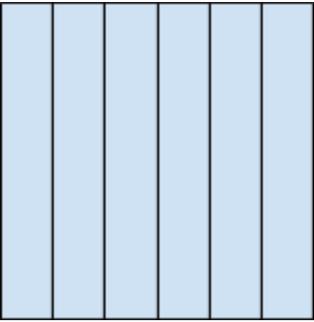
5th Grade Problem Solving, Round 2

1.	A rectangular prism has a volume of 384 cubic centimeters. The width 8 cm, which is double the height, and the length is three times the height. What is the length of the prism?	<u>12 cm</u>
2.	While on vacation, Craig bought a pair of sunglasses for \$15.98, a hat for \$7.99, 5 postcards, and a beach towel. The beach towel costs \$0.50 more than half the price of the sunglasses. Craig gave the cashier \$40 and got \$3.59 in change. Each postcard cost the same. How much did each postcard cost?	<u>\$0.79</u>
3.	Three years ago Mary was three times as old as her sister. Now Mary is twice as old as her sister. How old is Mary now?	<u>12</u>
4.	An apple pie and a pumpkin pie are being served at Thanksgiving dinner. The apple pie is sliced first. One person eats $\frac{1}{12}$ of the pie, a second person eats $\frac{1}{24}$ pie, and a third person eats $\frac{1}{12}$ pie. The pattern continues in this way. When the pumpkin pie is sliced for the first time, the first person eats $\frac{1}{9}$ of the pie, a second person eats $\frac{1}{18}$ pie, and a third person eats $\frac{1}{9}$ pie. The pattern continues in this way. If both pies have been eaten, how many more people have eaten apple pie than pumpkin pie?	<u>4 more people</u>

Team Number _____

Score _____ / 40

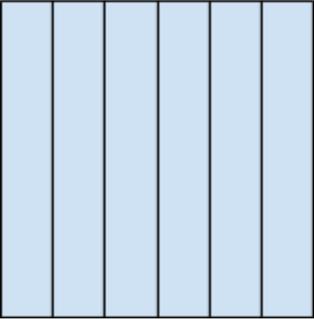
6th Grade Problem Solving, Round 1

1	Ten consecutive even integers sum to 70 and have a product of 0. Determine the product of the largest and smallest even integers in the set.	
2	I started my two clocks at the same time. One is slow and loses 2 minutes every hour; the other one is fast and gains 1 minute every hour. How long will it take for the faster clock to be 1 hour ahead of the slower clock?	
3	The square at the right is composed of 6 congruent rectangles. If the perimeter of each rectangle is 42 cm, what is the area of the square?	
4	One-third of the people in a convention room are seated in three-fourths of the chairs. The rest of the people in the room decide to stand. If there are 8 empty chairs, how many people are standing?	

Team Number _____

Score _____ / 40

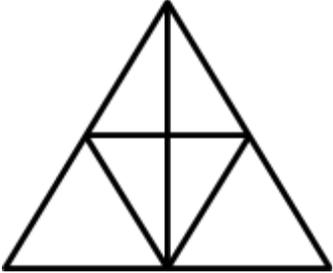
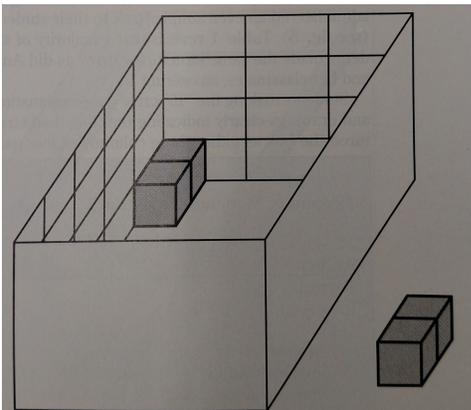
6th Grade Problem Solving, Round 1 Answers

1	Ten consecutive even integers sum to 70 and have a product of 0. Determine the product of the largest and smallest even integers in the set.	-32 (-2 x 16)
2	I started my two clocks at the same time. One is slow and loses 2 minutes every hour; the other one is fast and gains 1 minute every hour. How long will it take for the faster clock to be 1 hour ahead of the slower clock?	<u>20 minutes</u>
3	<p>The square at the right is composed of 6 congruent rectangles. If the perimeter of each rectangle is 42 cm, what is the area of the square?</p> 	324 sq cm
4	One-third of the people in a convention room are seated in three-fourths of the chairs. The rest of the people in the room decide to stand. If there are 8 empty chairs, how many people are standing?	48

Team Number _____

Score _____ / 40

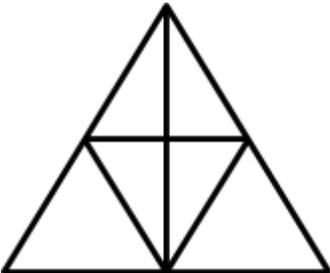
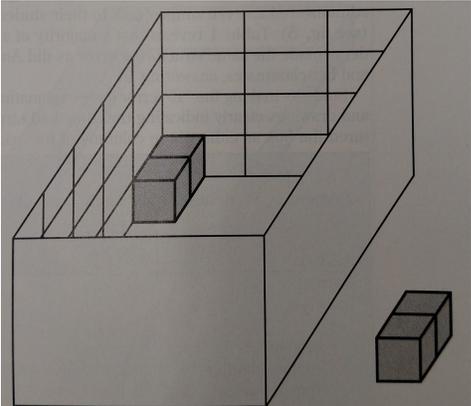
6th Grade Problem Solving, Round 2

1.	<p>Traveling at a constant rate, an astronaut takes 36 minutes to go 10,000 miles. At this rate, how far will she travel in the next 10 minutes? Express your answer to the nearest whole number.</p>	
2.	<p>A \$1000 item is discounted 30%. Then, additional discounts of 40% and 50% are applied to the already discounted price of the item. What is its sale price, in dollars, after the three successive discounts?</p>	
3.	<p>The midpoints of the sides and one of the vertices of an equilateral triangle are connected, as shown. what fraction of the triangle is shaded?</p> 	
4.	<p>How many packages made of two unit cubes will be needed to fill the box completely?</p> 	

Team Number _____

Score _____ / 40

6th Grade Problem Solving, Round 2

<p>1.</p>	<p>Traveling at a constant rate, an astronaut takes 36 minutes to go 10,000 miles. At this rate, how far will she travel in the next 10 minutes? Express your answer to the nearest whole number.</p>	<p><u>2778</u> <u>miles</u></p>
<p>2.</p>	<p>A \$1000 item is discounted 30%. Then, additional discounts of 40% and 50% are applied to the already discounted price of the item. What is its sale price, in dollars, after the three successive discounts?</p>	<p><u>\$200</u></p>
<p>3.</p>	<p>The midpoints of the sides and one of the vertices of an equilateral triangle are connected, as shown. what fraction of the triangle is shaded?</p> 	
<p>4.</p>	<p>How many packages made of two unit cubes will be needed to fill the box completely?</p> 	<p><u>120</u></p>

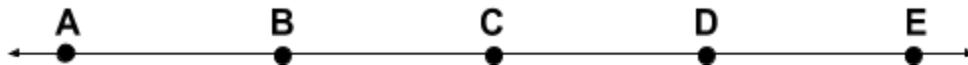
Team Number _____

Score _____ / 40

Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament 2016

5th and 6th Grade Nimble Number Line

Read each question aloud only. You may read each question no more than two times. Do not project the questions. You may project the number line diagram, but it is already included on the student answer sheet. Students will work as a team during this event. Only one student is permitted to hold a pencil and write down each answer for the team. Calculators are not used during this event.

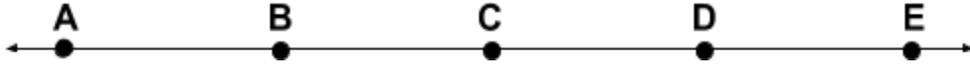


1.	If A = 0 and E = 1, what is the value of C?	C = 1/2
2.	If A = 14 and E = 38, what is the value of C?	C = 26
3.	If A = 14 and E = 38, what is the value of D?	D = 32
4.	If A = 2.5 and B = 5, name all points that have whole number values.	points B and D
5.	If B = 1/2 and C = 3/4, what is the value of E?	E = 1 1/4
6.	If B = 1/2 and C = 3/4, name all the points that have whole number values.	point D
7.	If B = 2/7 and D = 3/7, what is the value of C?	C = 5/14
8.	If B = 2/7 and D = 3/7, what is the value of A?	A = 3/14
9.	If C = 415 and D = 530, what is the value of A?	A = 185
10.	If C = 0 and D = 17, what is the value of A?	A = -34

Team Number _____

Score _____/10

Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament 2015
5th and 6th Grade Mental Math



Refer to the number line diagram to mentally reason with the following questions. All points labeled on the number line are equidistant.

1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Team Number _____

Score _____/10

Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament

Team Construction Activity

1. Draw two line segments horizontally to divide your graph into thirds.
2. Within the middle third, center a rectangle that has a perimeter of 24 centimeters. The difference between the length and the width of the rectangle should be 4 centimeters.
3. Beginning at the top, right corner, and working clockwise, label each vertex A, B, C, then D.
4. Plot a point to represent the midpoint on each side of rectangle ABCD.
5. Using 3 of the the midpoints, create an isosceles triangle.
6. Find the area of the isosceles triangle you created.
7. A (isosceles triangle) = _____ square centimeters

Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament

Team Construction Activity Rubric

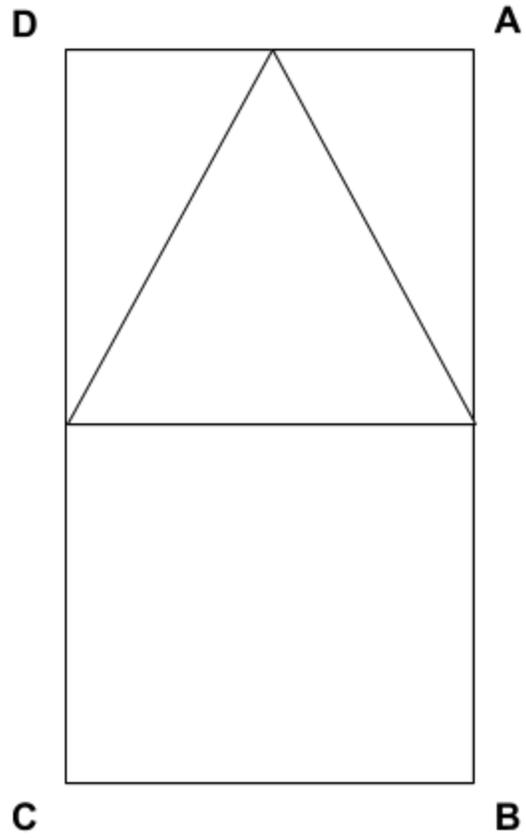
1. Graph has been split into thirds. _____/10
2. A rectangle that is 8 cm by 4 cm has been created in the middle section. _____/10
3. The rectangle is centered in the middle section. _____/10
4. The rectangle has been labeled ABCD going clockwise, starting at the
top, right corner. _____/10
5. Midpoints have been plotted on each side. _____/10
6. Three midpoints have been used to create an isosceles triangle. _____/10
7. The area of the triangle was found: $A=8$ sq cm _____/10

Team Number: _____

Total _____/70

Answer:

This drawing may not be to scale...and does not include the two lines that divide the paper into thirds.



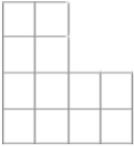
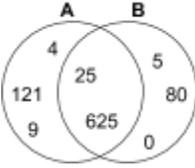
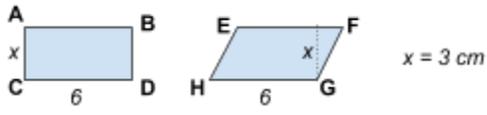
5th Grade Pile of 10

1.	What is the value of $5 \times (11 + 4 \div 4)$?	
2.	There were 212 boys and girls at a dance. There were 60 more boys than girls. How many boys and how many girls were at the dance?	
3.	The sum of a set of five different counting numbers is 25. The product of these five numbers in the set is 945. If two of the numbers are 1 and 9, what are the other three numbers?	
4.	Two parallelogram shaped pieces of tile have the same area. One has a base of 20 cm and a height of 15 cm. The other has a base of 25 cm. What is its height?	
5.	How old is Aunt Marci this year? She is in her thirties. Last year her age was divisible by 5; next year her age will be divisible by 4.	
6.	There are 12 people at a birthday party. There is enough pizza for each person to eat $\frac{3}{4}$ of a pizza. How many pizzas are there?	
7.	Cleo is paid \$5.00 per hour for babysitting. If she babysits past midnight, she is paid twice as much per hour. How much will she she earn if she babysits from 7 pm until 1:30 am?	
8.	A quarter weighs 6 grams and a dime weighs 2 grams. What is the difference in weight between \$4.50 in quarters and \$4.50 in dimes?	
9.	A baby polar bear's weight doubles every 4 months. If a polar bear weighed 11 lbs at birth, how much would it weigh at the age of 2?	
10.	The new Target is opening and has just posted their store hours. <i>Monday through Saturday</i> <i>8 am - 9:30 pm</i> <i>Sunday</i> <i>10 am - 7 pm</i> How many hours will Target be open each week?	

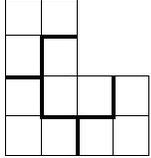
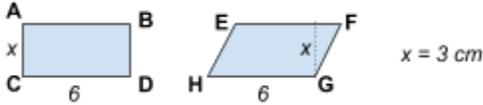
5th Grade Pile of 10

1.	What is the value of $5 \times (11 + 4 \div 4)$?	60
2.	There were 212 boys and girls at a dance. There were 60 more boys than girls. How many boys and how many girls were at the dance?	136 boys 76 girls
3.	A set of five different counting numbers sum is 25. The product of these five numbers in the set is 945. If two of the numbers are 1 and 9, what are the other three numbers?	3,5,7
4.	Two parallelogram shaped pieces of tile have the same area. One has a base of 20 cm and a height of 15 cm. The other has a base of 25 cm. What is its height?	12 cm
5.	How old is Aunt Marci this year? She is in her thirties. Last year her age was divisible by 5; next year her age will be divisible by 4.	31
6.	There are 12 people at a birthday party. There is enough pizza for each person to eat $\frac{3}{4}$ of a pizza. How many pizzas are there?	9 pizzas
7.	Cleo is paid \$5.00 per hour for babysitting. If she babysits past midnight, she is paid twice as much per hour. How much will she not earn if she babysits from 7 pm until 1:30 am?	\$999,999.99
8.	A quarter weighs 6 grams and a dime weighs 2 grams. What is the difference in weight between \$4.50 in quarters and \$4.50 in dimes?	18 grams
9.	A baby polar bear's weight doubles every 4 months. If a polar bear weighs 11 lbs at birth, how much would it weigh at the age of 2?	704 lbs
10.	The new Target is opening and has just posted their store hours. <i>Monday through Saturday</i> <i>8 am - 9:30 pm</i> <i>Sunday</i> <i>10 am - 7 pm</i> How many hours will Target be open each week?	90 hours

6th Grade Pile of Ten

1.	Two dice are thrown simultaneously. Find the probability of getting six as a product. Express your answer as a simplified fraction.		
2.	The sum of Sara's two numbers is 31. The square root of the difference of the same two numbers is 5. What are Sara's two numbers?		
3.	A rectangular prism is 18 inches tall and has a square base whose length is 9 inches. Find the surface area of the prism.		
4.	The median and mode are equal for this set of seven whole numbers: $\{1, 3, 4, 5, 6, 11, x\}$ The mean is also equal to the median and mode, and is one of the six known members of the set. What is the value of x ?		
5.	Divide the shape into four congruent parts. Darken the borders to clearly show the four parts.		
6.	The measure of angle X is twice the measure of its supplementary angle Y. What is the measure of angle X?		
7.	Study the Venn Diagram. Label sets A and B.		A: B:
8.	What is the area of parallelogram EFGH? 		
9.	The two-digit sum of two consecutive square numbers is also a square number. What is twice that sum?	hrasgdg,hj	
10.	Juan's sister, Anna, cuts a 36-inch piece of wire into two separate pieces. Each piece will be bent to form a square. The area of the larger square will be four times the area of the smaller square. What will be the area of the smaller area?	WHO ARE YOU	

6th Grade Pile of Ten Answers

1.	Two dice are thrown simultaneously. Find the probability of getting six as a product. Express your answer as a simplified fraction.	1/9
2.	The sum of Sara's two numbers is 31. The square root of the difference of the same two numbers is 5. What are Sara's two numbers?	28 and 3
3.	A rectangular prism is 18 inches tall and has a square base whose length is 9 inches. Find the surface area of the prism.	810 square inches
4.	<p>The median and mode are equal for this set of seven whole numbers:</p> <p align="center">{1, 3, 4, 5, 6, 11, x}</p> <p>The mean is also equal to the median and mode, and is one of the six known members of the set. What is the value of x?</p>	x = 5
5.	Divide the shape into four congruent parts. Darken the borders to clearly show the four parts.	
6.	The measure of angle X is twice the measure of its supplementary angle Y. What is the measure of angle X?	Angle X = 120 degrees
7.	<p>Study the Venn Diagram.</p> <p>Label sets A and B.</p>	<p>A: perfect squares B: numbers divisible by 5</p>
8.	<p>What is the area of parallelogram EFGH?</p> 	18 square cm
9.	The two-digit sum of two consecutive square numbers is also a square number. What is twice that sum?	50
10.	Juan's sister, Anna, cuts a 36-inch piece of wire into two separate pieces. Each piece will be bent to form a square. The area of the larger square will be four times the area of the smaller square.	A = 9 square inches

	What will be the area of the smaller area?	
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